REMARKS

Favorable reconsideration of the above identified application is requested in view of the following remarks.

The Examiner is thanked for acknowledging Applicant's claim for priority.

Claims 1-9 are pending in this application, with Claims 1, 6 and 8 being independent.

Beginning on the middle of page two of the Official Action, an issue is raised regarding mistakes in the specification. Accordingly, the relevant paragraphs of the specification are amended, thereby addressing this issue.

The Official Action rejects Claims 1, 5 and 8 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,339,365, hereinafter *Kawai*, in view of U.S. Patent No. 4,074,231, hereinafter *Yajima*; and Claims 2-4, 6, 7 and 9 under 35 U.S.C. § 103(a) as being unpatentable over *Kawai* in view of *Yajima* and further in view of NPL document, hereinafter *Baxes*.

Claim 1 is directed toward an image processing apparatus for conducting edge enhancement processing on an original image. An enhancement amount calculation unit calculates a density enhancement amount for each pixel in an edge area in the image. An enhancement amount processing unit corrects the density enhancement amount for each edge pixel in a manner to reduce variations in the density enhancement amounts in the overall edge area. A density processing unit corrects a density of each edge pixel of the original image in a manner to reduce variations in densities in the overall edge area. A density calculation unit calculates an enhanced density for each edge pixel from the corrected density and the corrected density enhancement amount.

Basically, Claim 1 generally relates to 1) calculation of an enhancement amount of the original density, 2) correcting the enhancement amount, 3) correcting the original density of each pixel, and 4) calculating the final density based on the corrected original density and the corrected enhancement amount.

Kawai discloses an image processing device having a smoother 103 and an edge emphasis unit 105. *Kawai* discloses changing the ratio of the edge emphasis and the smoothing, to continuously change characteristic amounts of an original image depending on whether the pixel is in a screen image, a character image, or a photographic image. In column 5, lines 28-44, *Kawai* describes that the mixing ratio is advantageous because depending on the kind of original image (e.g., character original, photograph, or printed matter) a different ratio of edge emphasis and smoothing is desired.

The Examiner recognizes that *Kawai* does not teach the claimed enhancement amount processing unit, and relies upon *Yajima* to cure the deficiency. The Examiner alleges that *Yajima* teaches "correction in the density of enhancement in a manner to reduce the variations in the density enhancement amounts in the edge area". Specifically, the Examiner alleges that the smoother 4 of *Yajima* functions to correct the density enhancement amount. However, the Examiner also appears to recognize that Yajima does not literally correct the density enhancement amount. The Examiner acknowledges that *Yajima* merely smooths an edge enhanced <u>image</u>. *Yajima* does not smooth an <u>edge enhancement amount</u>. The Examiner attempts to overcome this problem by arguing that the result would be the same since the operation is linear.

However, Applicant disputes the Examiner's conclusion. As set forth above, *Yajima* smoothes the edge enhanced image, not an edge enhancement amount. Thus, the value to be smoothed by *Yajima* is completely different than an edge enhancement amount. The edge enhancement amount is only an incremental portion of the edge enhanced image. Accordingly, smoothing of the edge enhanced image as taught by *Yajima* is far closer to smoothing the image data than it is to smoothing an edge enhancement amount.

According to the present invention, correcting of the density enhancement amount and correcting of the density of the image signal are done separately. As a result, the individual corrections are done more accurately.

Neither *Kawai* nor *Yajima*, alone or in combination, disclose the claimed device. *Kawai* shows a smoother 103 and an edge emphasis unit 105 that both act on image data. In other words, *Kawai* does not show either the smoother 103 or the edge emphasis unit 105 acting on density enhancement amount data (i.e., data separate from the image data). In fact, *Kawai* does not show density enhancement amount data at all. Should this rejection be maintained, it is requested that it be specifically pointed out where or how *Kawai* shows density enhancement data as claimed.

Yajima is relied upon to show correction of a density enhancement amount, and it is stated in the Official Action that *Yajima* "discloses smoothing of the edge enhanced image to reduce variations in density. This would have same effect as the smoothing of enhancement amount and adding that to the original image." However, an edge enhanced image is different than enhancement amount data as claimed. The claimed enhancement amount data is produced and treated separately from the

image data and the corrected image data. Thus, as relied on in the Official Action, *Yajima* does not show correction of a density enhancement amount.

Claim 8 defines a method for conducting edge enhancement processing. A density enhancement amount for each edge pixel of the original image is calculated, the edge pixel being a pixel in an edge area in the image. The density enhancement amount for each edge pixel is increased in a manner to reduce variations in the density enhancement amounts in the overall edge area. The density of each edge pixel of the original image is increased in a manner to reduce variations in densities in the overall edge area. The density of each edge pixel is calculated by adding the increased density enhancement amount to the increased density image.

As noted above with respect to Claim 1, neither *Kawai* nor *Yajima* show increasing a density enhancement amount, increasing a density of each pixel of an original image, and then calculating the enhanced density of each edge pixel by adding the enhanced amount to the increased density. Thus, the cited disclosures do not disclose the method defined by Claim 8.

Claim 6 is generally directed toward an image processing apparatus for conducting edge enhancement. A judgment unit judges whether a target pixel is an edge pixel which is in an edge area, based on the image data. An enhancement amount calculation unit calculates first data that expresses an edge enhancement amount for the target pixel based on the image data. A first processing unit changes a value of the first data to a greatest value among first data of the target pixel and a plurality of pixels surrounding the target pixel. A second processing unit changes the value of the image data of the target pixel to a greatest value among the image data of the target pixel and a plurality of pixels surrounding the target pixel. An addition

unit adds the changed first data to the changed image data of the target pixel that is judged to be an edge pixel by the judging unit, and outputs the resulting data.

The Official Action relies on *Baxes* for a disclosure of changing the target pixel to the greatest value among the target pixel and surrounding pixels.

As noted above, neither *Kawai* nor *Yajima* show calculation of an enhancement amount of the image data, correction of the enhancement amount to reduce variations, and correction of a density of the image data to reduce variations. Thus, neither *Kawai* nor *Yajima* show the claimed features directed toward calculation of a first data that expresses an edge enhancement amount, correction of the first data, and changing the image data target pixel to be the greatest value among the image data of the target pixel and a plurality of surrounding pixels, together with the other claimed features. For at least this reason, Claim 6 is allowable.

Also, *Baxes* discloses dilation of a grey scale image. In other words, the brightness of the original data is increased or decreased based on the surrounding pixels thereby increasing or decreasing the size of the image. See Figs. 5.18a and 5.18 b, and the accompanying description. Therefore, *Baxes* does not show correction of <u>first image data</u> that expresses an edge enhancement amount for the target pixel, for which it is relied upon. For this reason too, Claim 6 is allowable.

Claims 2-5, 7 and 9 are allowable at least by virtue of their dependence from allowable independent claims, and also because they define features that distinguish over the cited disclosures.

For example, Claims 2-4 and 9 are generally directed toward features relating to changing density of a target pixel in an edge area to a greatest density in a

predetermined area that includes the target pixel and the edge pixels surrounding

the target pixel. As noted earlier with respect to Claim 6, the cited disclosures do not

disclose the features defined by Claims 2-4 and 9.

For at least the reasons stated above, it is requested that all the rejections

and objections be withdrawn, and that this application be allowed in a timely manner.

Should any questions arise in connection with this application, or should the

Examiner feel that a teleconference with the undersigned would be helpful in

resolving any remaining issues pertaining to this application, the undersigned

requests that he be contacted at the number indicated below.

Respectfully submitted,

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